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Report to the Honorable Board of Directors

OF THE

SOUTH SANTA CLARA VALLEY WATER CONSERVATION DISTRICT

ON

Proposed Uvas Dam and Water Conservation Works

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Project Report No. 24

December 1954

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BLACKIE AND WOOD
Civil Engineers

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SAN FRANCISCO 4, CALIF.

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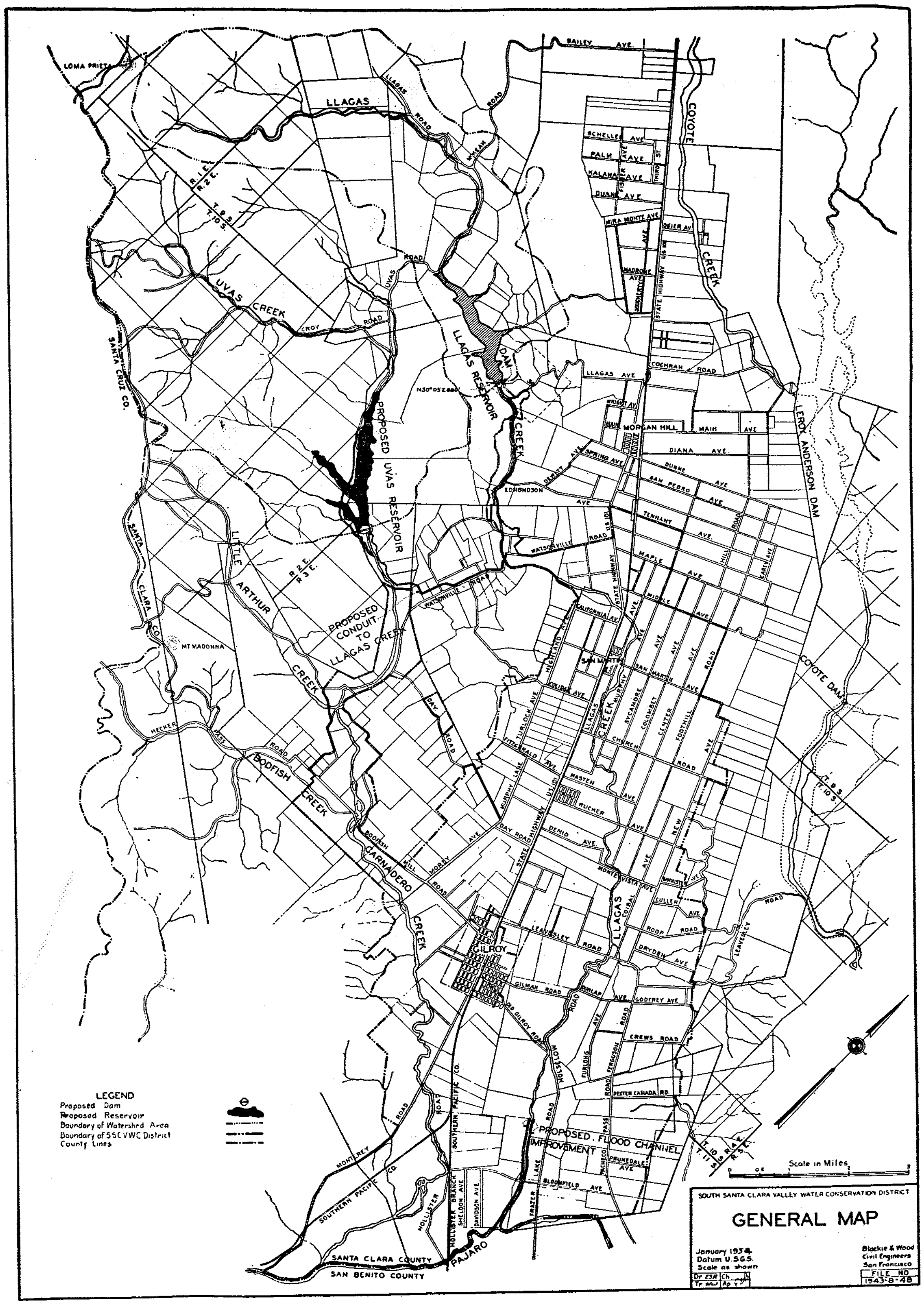

BLACKIE AND WOOD

CIVIL AND CONSULTING ENGINEERS

SAN FRANCISCO

December 17, 1954

Subject: South Santa Clara Valley Water Conservation District

Uvas Dam and Water Conservation Works

HONORABLE BOARD OF DIRECTORS,
South Santa Clara Valley Water Conservation District,
City Hall, Gilroy, California.

Gentlemen:

As instructed by you at your meeting on December 10, 1954, we have prepared a report on Uvas Dam and Water Conservation Works.

At the present time your District is constructing the Elmer J. Chesbro Dam on Llagas Creek. The reservoir created by this dam will have a storage capacity of 7,500 acre feet. The project on Uvas Creek, as considered herein, is supplementary to, and must be operated in complete harmony with the Llagas Creek development. In fact, the two should be thought of as parts of a single project by which the supply of water available to your District will be increased.

WATER RIGHTS:

A valid right to the use of water is essential in any water development program. In 1950, you made applications to the State for use of the unappropriated waters of both Llagas and Uvas Creeks. A permit has been granted by the State for the full use of Llagas Creek waters. On Uvas Creek, a protest was filed by the California Fish and Game Division. This protest is now in the process of being withdrawn, thus making it possible for the State to grant the Permit for the Uvas Creek waters.

RUNOFF RECORDS:

The U. S. Geological Survey has operated a recorder station at the dam site and has determined the mean daily flow in Uvas Creek at this point from December 1, 1930, to September 30, 1953. The District established a station a short distance downstream from the dam now under construction on Llagas Creek on December 29, 1941, and the mean daily flow in this stream is available from that date to September 30, 1953. This results in practically a twelve year period during which the daily runoff is available on the two streams, and provides an unusually good basis for determining the benefits that will accrue to the District from the work now under way on Llagas Creek and proposed on Uvas Creek.

The uncontrolled area below the Elmer J. Chesbro Dam on Llagas Creek produces very little usable runoff and has been neglected in our yield studies. Below the proposed dam on Uvas Creek, however, there is a substantial drainage area which is estimated to produce 77 per cent as much water as is measured at the dam site. This has been taken into consideration in making our analyses of yield that would be obtained as the result of the District's works.

PERCOLATION RATES:

The District has always planned, by means of surface reservoirs, to detain flood water that would otherwise run to waste, and the gradual release of such flood water into natural streams at a rate so reduced that it would be entirely absorbed in the natural stream-beds as released and passed into underground storage. This is the fundamental concept of present plans, and it therefore follows that the absorptive capacity of the natural stream beds is essential to a determination of the benefits that will accrue from any District works.

Between March 1948 and January 1950, the State Division of Water Resources made an extensive investigation of the water resources of Santa Clara Valley, including the area within the present boundary of your District. Among other things it was determined that the sustained rate of percolation under present conditions was 10 and 30 cubic feet per second for Uvas and Llagas Creeks, respectively. It was also estimated by the State that percolation in Llagas Creek could be increased to about 50 cubic feet per second by the construction of spreading dams.

It is to be noted that a much greater amount of water can be percolated in Llagas Creek than in Uvas Creek. By reference to Plate 1, it will be seen that Llagas Creek traverses the main portion of the District, whereas Uvas Creek and its continuation, Carnadero Creek, passes through only a very small part of the District. Hence, it follows that surplus Uvas water must be transferred to and percolated in Llagas Creek, if maximum benefits are to be obtained. This is the proposed plan.

PROPOSED WORKS:

The works herein proposed consist of a storage reservoir on Uvas Creek and a concrete pipe line to conduct surplus Uvas water to Llagas Creek. It is further proposed that these works be built and operated solely by the South Santa Clara Valley Water Conservation District.

The dam necessary to form this reservoir would be a rolled earth fill structure of conventional design, with a chute-type, concrete-lined, spillway channel of adequate capacity for the maximum anticipated flood and outlet works to control the releases to the City of Gilroy, downstream users and to Llagas Creek. The operation of these storage works would necessitate the relocation of a portion of the existing Uvas Road.

By making repeated designs and estimates, it has been determined that a dam about 110 feet high with a storage capacity behind it of 10,000 acre-feet, together with the required road relocation and concrete pipe line to Llagas Creek could be constructed by the expenditure of ~~an amount practically identical with your District's share of the formerly proposed development on Uvas Creek with the northern district, as reported in Project Report No. 15~~. $2,111,000.

The pipe line to Llagas Creek was designed and estimated for a capacity of 50 cubic feet per second, although nothing has been included for spreading work. This was done because it is believed that the larger capacity is estimated to increase the cost of this development by only 2.5 per cent, whereas providing the additional capacity at a later date would involve installing a parallel pipe line at a cost of at least four times that of providing the larger pipe line to begin with. The provision of spreading works on Llagas Creek is thought to be a matter for the future, inasmuch as the proposed works would more than offset the deficiency in supply for some time to come.

It is a part of the proposed work on the Uvas development to clear the lower channel of the Carnadero Creek from the southerly boundary of the District northerly to the extent of $35,000. This amount has been included in the Estimate of Cost. It should be remembered, in addition to the relief this channel clearing will offer, the storage reservoir itself will offer a great measure of protection in reducing the peak flows at times when the reservoir is filling.

ESTIMATED COST:

Based on the actual bid prices obtained on the Llagas Creek, work adjusted for the differences in conditions on Uvas Creek and anticipated trends in costs, we have estimated that the major items of work involved in the proposed Uvas Dam and Water Conservation Works can be built for the following amounts:

Dam and appurtenances (including reservoir clearing and right-of-way)	$1,313,000.
Relocation of County Road	445,000.
Uvas-Llagas Pipe Line	318,000.
Carnadero Creek Channel Clearing	35,000.
TOTAL	$2,111,000.

YIELD

We have determined the yield, or benefits, to be obtained from the Uvas Dam and Water Conservation Works when operated in full coordination with the Elmer J. Chesbro Dam on Llagas Creek and after caring for all prior rights on Uvas Creek. To do this we have considered every day's flow in the two streams for the twelve years of record, and determined the amount that would have been retained in each of the two storage reservoirs and the amount that could have been released for use. The sum of these daily amounts for each type of use was then determined for each year and a yearly average for the twelve year period computed. These yearly averages show that with 4,000 acre feet of conservation and 3,500 acre feet of flood control storage on Llagas Creek, and 10,000 acre feet of storage on Uvas Creek, it would have been possible to have conserved over 14,000 acre feet per year. This includes an increase of over 4,000 acre feet to Llagas Creek and over 2,000 acre feet to Uvas Creek users.

This 14,000 acre feet compares with the State's estimated deficiency in supply of 8,000 acre feet in 1948-49 for the entire Southern Santa Clara Valley, and an estimated ultimate deficiency of 20,000 acre feet per season.

CONCLUSION:

Your District could build a 10,000 acre foot reservoir on Uvas Creek at a cost no greater than estimated for your District's share of the heretofore proposed joint development with the Santa Clara Valley Water Conservation District. It is also concluded that the 10,000 acre foot storage—Uvas Dam and Water Conservation Works—would result in over twice as much benefit to your District as the joint development.

Respectfully submitted,

BLACKIE AND WOOD,
Engineers for South Santa Clara
Valley Water Conservation District

By HAROLD WOOD